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NEBC MEETING NEWS

April 1996. Dr. Christopher Campbell of the University of Maine spoke on "Visions of Sugar Plums Dancing in My Head: An Apomictic Nightmare." He was led to the study of the very difficult genus *Amelanchier* in part because he lives in the center of diversity of the genus, and because the University thoughtfully planted research material at the door of his office. He obviously hadn't read Ed Voss's statement that "The only advantage that *Amelanchier* has over *Crataegus* and *Rubus* is that, by being smaller, it lures us to the hope that it will be more manageable."

The shadbushes are a taxonomic nightmare, and appear to be a complex of hybrids and apomictic (asexual) taxa that are referred to as "microspecies." Dr. Campbell has been investigating whether agamospermy actually is responsible for the formation of microspecies, attempting to determine how much hybridization actually occurs, and the extent to which these two forces shape evolution in the genus.

Amelanchier appears to be an old genus, represented in eastern Asia, Europe, and Asia Minor, as well as in western and eastern North America where the highest diversity occurs. One species of western North America, *A. alnifolia*, is cultivated for its edible fruits known as "sugarplums." Although not morphologically distinct, the western and eastern North American taxa are highly distinct genetically. This genetic difference is most clearly reflected in fruit taste—all of the tasty species are western, with the exception of the eastern *A. humilis*. There is no consensus on the actual number of species in the genus; various treatments range from 6 to 33, with virtually all of the taxa polyploid and most at least facultatively agamospermic. All possible hybrids have been reported for the New England taxa.

Dr. Campbell's research has combined studies of morphological and genetic variation, as well as experimental hybridizations. A series of controlled crosses shows that inheritance of genetic markers is strongly maternal, indicating that hybridization rarely occurs and that sex is not responsible for the introduction of genetic variation. He compared within and among population variation for *Amelanchier bartramiana* (a sexual species) and *A. laevis* (an agamospermous species). This research has shown that, contrary to most hypotheses, sexual and apomictic species do not partition variation differently, and that variation is greater in the

sexual species. Results were not conclusive on the question of whether agamospermy is responsible for the formation of microspecies. This research on hybridization has shown clearly that *Amelanchier* × *neglecta* is a hybrid of *A. bartramiana* and *A. laevis*, with the apomictic *A. laevis* serving as the pollen parent. *Amelanchier* × *neglecta* is almost entirely agamospermous, with no evidence of backcrossing with its parents.

Other research on a confusing plant known informally as *Amelanchier* "humilopsis" suggests that it is an old hybrid of *A. humilis* and an unknown species, both agamospermous. This plant has an unusual multigene polymorphism that is maintained by agamospermy. Dr. Campbell has observed "humilopsis" and *A. laevis* hybridizing at a disturbed site, and hypothesizes that Fernald saw these plants as a child growing up in Orono.

It appears that agamospermy by itself does not generate variation in *Amelanchier*, but perpetuates the diversity that results from extensive hybridization. Future attempts to resolve the taxonomy of *Amelanchier* should identify and focus on the sexual species that are the oldest and most stable members of the genus.

May 1996. Dr. Gregory Anderson, of the University of Connecticut at Storrs, spoke on "The Origin and Evolution of the Pepino, One of the Forgotten Domesticates of the Incas."

The Pepino (*Solanum muricatum*) is truly a lost crop, with no known wild progenitors. Domesticated prior to the Incas in the Ecuador/Columbia/Peru area, pepinos appear in pottery dating back 2,000–3,000 years, but were not much cultivated by Incan cultures. The name derives from the Spanish, who named it "pepino dulce" to distinguish it from the earlier-named "pepino" or cucumber. Now becoming more popular as a "dessert-quality subacid fruit" with a high vitamin C content, it is cultivated from Mexico to Chile as well as in New Zealand.

Pepinos exhibit great variation in fruit morphology, consistent with the "first law of economic botany," which states that the greatest variation occurs in that feature for which the species was cultivated. The result of recent intensive cultivation has been a substantial loss in fruit diversity.

Morphological studies suggested that there were 3 candidates for the wild progenitor of pepino: *Solanum tabanoense*, *S. caripense*, and *S. basendopogon*. Studies by Greg and numerous collaborators have examined "traditional" biosystematic evidence